

Upper South Platte Source Water Assessment and Protection Plan



Unpaved Roads and Trails

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Background

- Four watershed / unpaved roadway system assessments – USFS chronic problem
 - Sugar Creek, Pine Creek, and Bear Creek
 - 11 Mile Canyon and surrounding areas assessment is ongoing
- Assessed the watersheds related to roads, drainage systems, sediment problems, habitat and fisheries concerns, maintenance, and more
- Developed a repeatable process, tools, and BMP tool box
- Partners include CUSP, USFS, counties, parks departments, water providers, SPEB, trout unlimited, and others

Unpaved Roads and Trails

- Typically in mountainous or rural areas
- Used by vehicles, equestrians, OHVs, pedestrians, bikers, etc.
- Often in valley bottoms along streams
 - 303d listings - sediment
- Many roads built prior to design criteria



Typical Roads



Typical Trails



Proximity to Streams



Road Networks



Drainage Systems



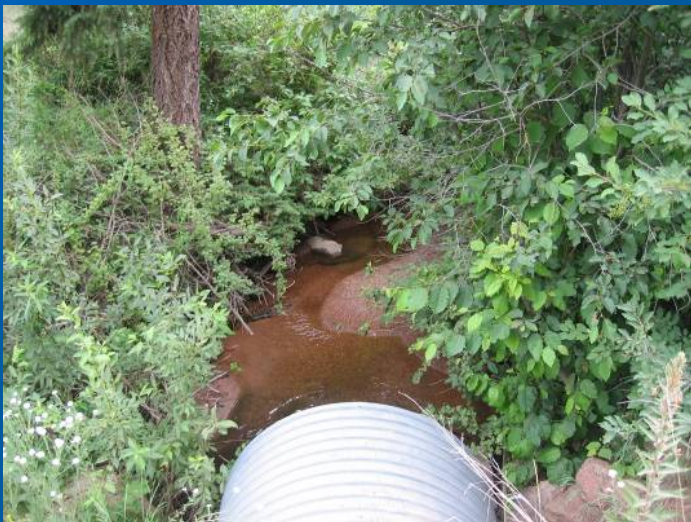
Structures



Erosion



Impacts to Habitat



Impacts to Streams



Safety

- Speeding
- Narrow Roads
- Blind curves
- Washboards
- Limited Parking
- Steep side slopes



Maintenance



Road Ownership and Responsibility

- Federal: USFS, BLM, FHWA, CFL
- State Highways
- County Roads
- Private, including stream crossings
- Missing documentation
 - Undefined easements
 - Who maintains?
 - Who pays?

BMP Toolbox

- Developed as part of the Sugar Creek Assessment, and built upon with later projects
- Provides:
 - BMP Type
 - Description
 - Considerations
 - Representative Item
 - Typical Measurement Unit and Unit Cost
 - Typical Benefit to Cost Rating

BMP Examples

- Roadway Surface
 - Paving types
 - Additives for surface stabilization
- Geometrics
 - Realignment
 - Cross section strategies
 - Cross slope strategies
 - Rolling Dips

BMP Examples

- Water Control
 - Swales, ditches, culverts
 - Inlets
 - Culverts and pipes
- Erosion Control
 - Drainage capacity
 - Outlet protection
 - Conveyance protection

BMP Examples

- Stream protection from roadway runoff
 - Water control
 - Curbs and barriers
 - Vegetation strategies
- Operations and Maintenance Changes
 - Grading, surface management
 - Culvert and ditch cleaning
- Slope Stabilization
 - Seed, mulch, plantings
 - TRM
 - Walls

BMP Examples

- Sediment Control
 - Check dams
 - Sediment traps
 - Sediment basins
- Stream Protection
 - Bank protection
 - Grade control
 - Habitat improvements
 - Barrier removal

Aquatic Organism Passage

- Terminology used by USFS, FHWA, and others
- New method for roadway crossings of streams
- No longer use fish swim speeds / jump heights
- Match the natural stream characteristics
- Culvert / structure is sized for AOP
- Allows passage by aquatic species, fish, and small mammals inside the structure

Sugar Creek Sediment Mitigation Pilot Project



Sugar Creek Pilot Maintenance

- Douglas County conducted maintenance
 - Crews are very pleased with the structures
 - Easier, faster, and cheaper to maintain
 - Sediment doesn't enter creek
 - Request for traps on every culvert



Other Sediment Control Technologies



Extreme Events

- Extreme events
 - Beetle kill
 - Wildfire
 - Heavy rainfall and floods
 - Drought
- Lack of maintenance (can become extreme)
- These increase the problems associated with unpaved roads and trails

Source Protection Connections

- Regulations and water quality (303d, etc.)
- Erosion and sediment
 - Moves downstream and fills diversion, reservoirs, etc.
 - Difficult and costly to remove once in the reservoir
 - Decreases the life span of the reservoir
- Access – Erosion can prevent access to:
 - Critical water facilities
 - Reservoirs, pump stations, pipelines, etc.
 - Power facilities required for water supply
 - Emergency situations (remote staff, etc.)
- Overall watershed health
 - State Water Plan will include watershed health

Thank You



Questions?

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